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Montana's Timber Production and Mill Residue, 1988

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ACKNOWLEDGMENTS

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RESEARCH SUMMARY

Montana's timber production in 1988 was 237.3 million cubic feet (1,232.6 million board feet, Scribner rule), up 8 percent from 1981. Sawlog production was 189.5 million cubic feet (1,000.0 million board feet). Veneer log volume was 38.9 million cubic feet (205.3 million board feet). Lodgepole pine comprised 29 percent, Lincoln county 26 percent, and National Forest lands 40 percent of the harvest. Mill residue volume was 183.6 million cubic feet, 91 percent of which was used, most for pulp chips, board fiber, or industrial plant fuel.

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INTRODUCTION

This bulletin reports the estimated timber production and mill residue of Montana in 1988, coinciding with the year of forest inventory.

The Bureau of Business and Economic Research at the University of Montana (Missoula) canvassed primary wood processing plants to collect the data for this bulletin (tables 1 through 20). Resident mills and those located outside Montana that consumed timber products (industrial roundwood) originating in Montana were contacted. Mill operators were asked to supply information about the timber they used during 1988. This information included the volume, species, product type, ownership and county of origin of timber products, and an estimate of mill residue volume by type.

The appendix includes the conversion factor table.

TIMBER PRODUCTION

In 1988, Montana's timber production, which does not include fuelwood, was 237.3 million cubic feet, up almost 8 percent from 1981's 220 million cubic feet (fig. 1). Sawlogs continued to be the dominant product (tables 1 through 9), accounting for 80 percent of the volume of all industrial roundwood harvested. The 1988 sawlog harvest volume represents an 18 percent increase over the level in 1981 (fig. 2). The reported volume of veneer logs was 38.9 million cubic feet, down 2.1 million cubic feet from 1981. Production of other timber products such as posts and poles, house logs, round pulpwood, and cedar logs was 8.9 million cubic feet. Lodgepole pine (*Pinus contorta*) made up 29 percent of the harvest (tables 1-3, 10-12, 16-18, fig. 3), followed by Douglas-fir (*Pseudotsuga menziesii*), 27 percent, ponderosa pine (*Pinus ponderosa*), 16 percent, and western larch (*Larix occidentalis*), 14 percent. Live trees provided 93 percent (220.9 million cubic feet) of the timber production. When timber products from live trees were considered, Douglas-fir was most common, 63.4 million cubic feet (29 percent of timber production from live trees), followed by lodgepole pine, 56.1 million cubic feet (25 percent). Of the 16.4 million cubic feet of timber products from dead trees,

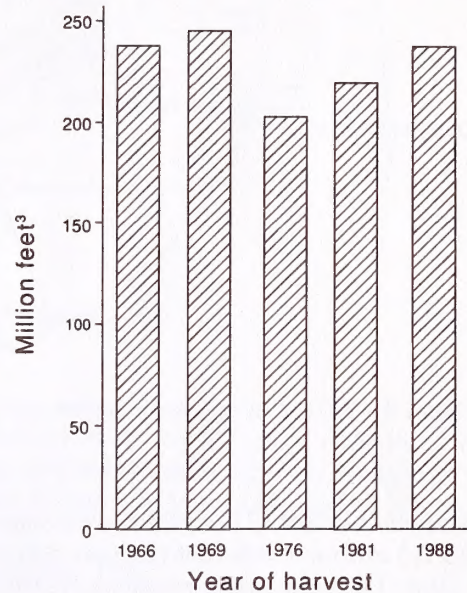


Figure 1—Montana's timber production by selected years (Setzer 1971; White and others 1980; Keegan and others 1983).

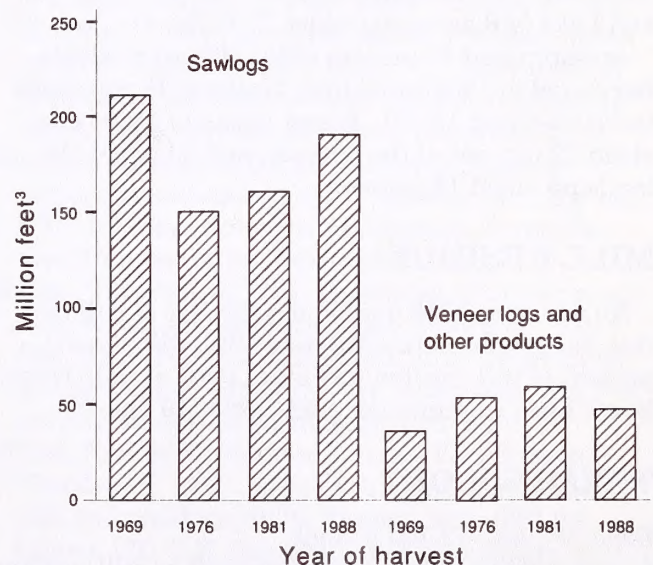


Figure 2—Montana's timber production by product for selected years (Setzer 1971; White and others 1980; Keegan and others 1983).

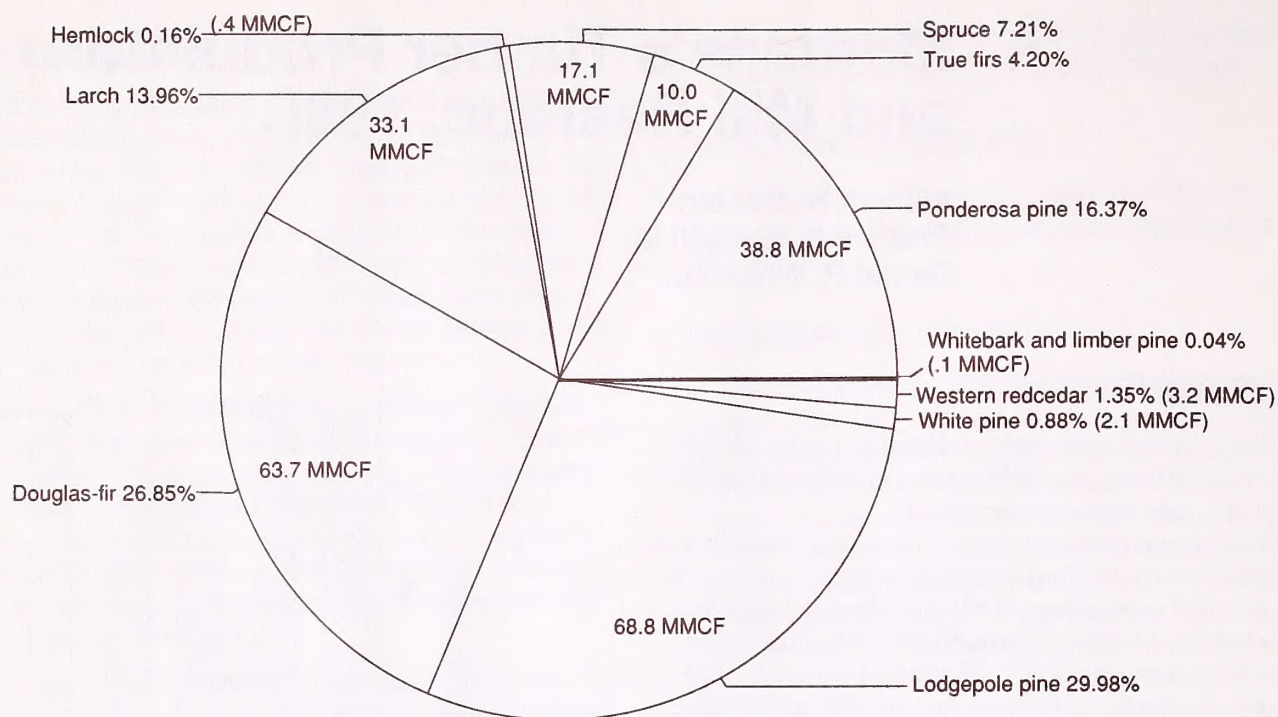


Figure 3—Volume by species in million cubic feet, Montana, 1988.

12.7 million cubic feet (77 percent) was lodgepole pine and 2.5 million cubic feet (15 percent) was ponderosa pine. Growing-stock removals associated with the timber harvest were 248.2 million cubic feet; sawtimber removals were 1,131.6 million board feet, Scribner rule, or 1,328.6 million board feet, International ¼-inch rule (McLain in preparation).

Lincoln County provided 26 percent of Montana's harvest, followed by Flathead (20.6 percent), Missoula (11.3 percent), Sanders (7.2 percent), and Lake (4.6 percent) (tables 7-15, fig. 4).

An estimated 40 percent of the timber products harvested in 1988 came from National Forest lands (tables 4-6 and 13-18). Forest industry lands provided 32 percent of the harvest, and other private lands provided 19 percent.

MILL RESIDUE

An estimated 183.6 million cubic feet of mill residue was produced in 1988 (table 20). Ninety-one percent of this residue was used, most as pulp chips, board fiber, or industrial fuel (tables 19 and 20).

TERMINOLOGY

Bone dry unit—2,400 pounds.

Coarse residue—That part of sawmill or mill residue suitable for chipping, such as slabs, edgings, and trimmings.

Fine residue—That part of sawmill or mill residue finer than coarse residue, consisting of sawdust and shavings.

Growing-stock trees (in this publication)—Sawtimber trees and poletimber trees. These are live trees of timber species that meet specified standards of size, quality, and vigor; excludes cull trees, nontimber tree species, and dead trees. See *sawtimber trees* and *poletimber trees*.

Growing-stock volume—Net cubic-foot volume in growing-stock trees (poletimber and sawtimber) from a 1-foot stump to a minimum 4-inch top (of central stem) diameter outside bark or to the point where the central stem breaks into limbs.

Industrial wood products—All timber products except fuelwood.

Logging residue—The unused growing-stock or sawtimber volume of trees cut or killed by logging and left in the woods.

Mill residue—Wood material from primary manufacturing plants not utilized for the mill's primary product. Includes bark, slabs, edgings, trimmings, miscuts, sawdust, and shavings.

Poletimber trees—Live trees of timber species, at least 5-inches diameter at breast height (d.b.h.) but smaller than sawtimber size, containing at least one 8-foot bolt, and more than one-third sound.

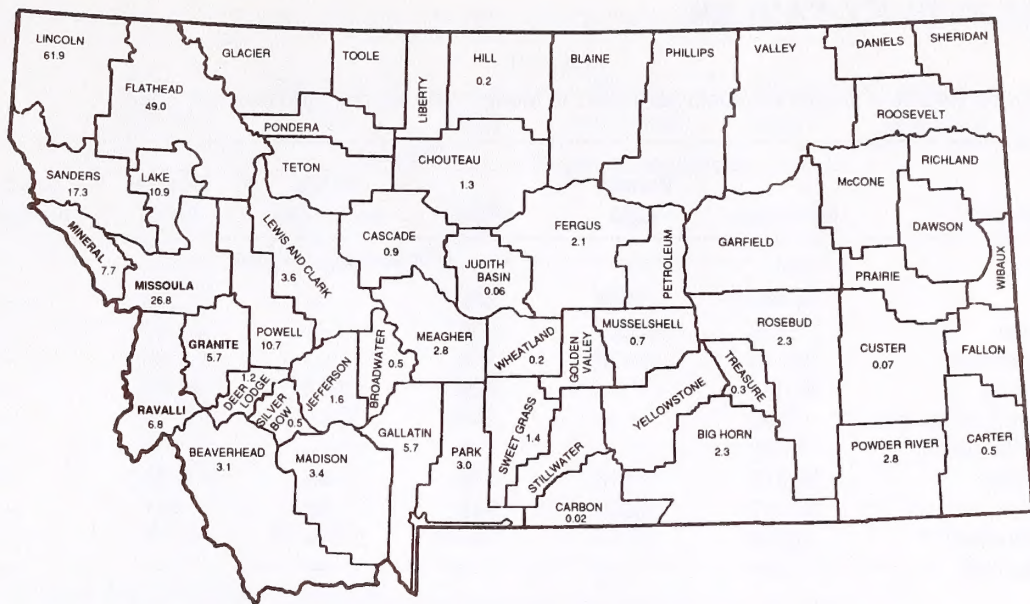


Figure 4—Timber production by county in million cubic feet, Montana, 1988.

Removals (in this publication)—The growing-stock and sawtimber volume removed from the inventory by harvesting. Consists of logging residue and the growing-stock and sawtimber volume of products.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The portion on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7-inches diameter outside bark (d.o.b.) for softwoods and 9-inches d.o.b. for hardwoods.

Sawtimber product volume—The sawtimber volume in timber products.

Sawtimber removals (in this publication)—The sawtimber volume removed from inventory by harvesting. Consists of logging residue and the sawtimber volume of products.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9-inches d.b.h. and hardwood trees at least 11-inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Timber production—The harvested volume of timber products. Also called industrial roundwood production or industrial wood production. Timber products or industrial roundwood (products) refer to logs, bolts, or other round sections cut from trees for industrial or consumer use and delivered "in the round" as logs or bolts to sawmills, plants, or yards. In this report, the term "timber products" does not include fuelwood. Included are sawlogs, veneer logs, pulpwood, utility poles, corral

poles and posts, house logs, and fiber logs. Mine timbers and landscaping timbers would have been included if they had been reported as harvested.

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FOREST SURVEY TABLES

Table 1—Cubic volume of timber products harvested in Montana by species and product, 1988

Species	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
	----- Thousand cubic feet -----						
True fir	8,494	909	572	—	—	—	9,975
Western larch	17,759	15,055	255	—	56	—	33,125
Engelmann spruce	15,613	1,420	18	—	60	—	17,111
Lodgepole pine	62,322	—	492	3,904	2,050	—	68,769
Whitebark and limber pine	100	—	—	—	—	—	100
Western white pine	2,082	—	5	—	2	—	2,089
Ponderosa pine	36,572	1,716	475	48	33	—	38,844
Douglas-fir	43,132	19,803	243	38	491	—	63,708
Western redcedar	3,060	—	—	—	(²)	134	3,194
Western hemlock	374	—	—	—	—	—	374
All species¹	189,510	38,903	2,059	3,990	2,693	134	237,289

¹Data may not sum to totals due to rounding or truncating.

²Less than 500 cubic feet.

Table 2—Board-foot (Scribner rule) volume of timber products harvested in Montana by species and product, 1988

Species	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
	----- Thousand board feet -----						
True fir	44,826	4,795	3,016	—	—	—	52,637
Western larch	93,715	79,448	1,344	—	295	—	174,802
Engelmann spruce	82,391	7,495	95	—	314	—	90,295
Lodgepole pine	328,879	—	2,595	1,459	10,820	—	343,753
Whitebark and limber pine	527	—	—	—	—	—	527
Western white pine	10,985	—	27	—	12	—	11,024
Ponderosa pine	192,995	9,054	2,505	—	175	—	204,729
Douglas-fir	227,611	104,501	1,284	—	2,592	—	335,988
Western redcedar	16,147	—	—	—	2	705	16,854
Western hemlock	1,976	—	—	—	—	—	1,976
All species¹	1,000,052	205,293	10,866	1,459	14,210	705	1,232,585

¹Data may not sum to totals due to rounding or truncating.

Table 3—Board-foot (International ¼-inch rule) volume of timber products harvested in Montana by species and product, 1988

Species	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
----- Thousand board feet -----							
True fir	52,680	5,635	3,544	—	—	—	61,859
Western larch	110,134	93,367	1,579	—	347	—	205,427
Engelmann spruce	96,826	8,808	112	—	369	—	106,115
Lodgepole pine	386,499	—	3,050	1,715	12,716	—	403,979
Whitebark and limber pine	619	—	—	—	—	—	619
Western white pine	12,910	—	32	—	14	—	12,955
Ponderosa pine	226,808	10,640	2,944	—	206	—	240,598
Douglas-fir	267,488	122,810	1,509	—	3,046	—	394,853
Western redcedar	18,976	—	—	—	2	828	19,807
Western hemlock	2,322	—	—	—	—	—	2,322
All species¹	1,175,261	241,260	12,770	1,715	16,700	828	1,448,534

¹Data may not sum to totals due to rounding or truncating.**Table 4—Cubic volume of timber products harvested in Montana by owner and product, 1988**

Owner	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
----- Thousand cubic feet -----							
National Forest	88,117	3,336	190	1,810	1,949	115	95,516
Bureau of Land Management	873	706	—	—	—	—	1,579
State	6,362	1,302	—	124	111	—	7,900
Tribal	8,994	718	948	501	—	—	11,161
Forest industry	42,346	32,685	221	174	95	14	75,534
Other private	42,818	156	701	1,381	539	5	45,599
All owners¹	189,510	38,903	2,059	3,990	2,693	134	237,289

¹Data may not sum to totals due to rounding or truncating.**Table 5—Board-foot (Scribner rule) volume of timber products harvested in Montana by owner and product, 1988**

Owner	Product						All products ¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
	----- Thousand board feet -----						
National Forest	464,997	17,606	1,000	623	10,284	606	495,116
Bureau of Land Management	4,608	3,723	—	—	—	—	8,331
State	33,575	6,873	—	21	585	—	41,054
Tribal	47,460	3,791	5,000	—	—	—	56,251
Forest industry	223,460	172,479	1,166	—	499	75	397,679
Other private	225,952	821	3,700	815	2,842	24	234,154
All owners ¹	1,000,052	205,293	10,866	1,459	14,210	705	1,232,585

¹Data may not sum to totals due to rounding or truncating.

Table 6—Board-foot (International ¼-inch rule) volume of timber products harvested in Montana by owner and product, 1988

Owner	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
	----- Thousand board feet -----						
National Forest Bureau of Land Management	546,464	20,691	1,175	732	12,086	712	581,860
State	5,415	4,375	—	—	—	—	9,791
Tribal	39,457	8,077	—	25	687	—	48,247
Forest industry	55,775	4,455	5,876	—	—	—	66,106
Other private	262,610	202,697	1,370	—	586	88	467,352
	265,539	965	4,348	958	3,340	28	275,178
All owners¹	1,175,261	241,260	12,770	1,715	16,700	829	1,448,534

¹Data may not sum to totals due to rounding or truncating.**Table 7**—Cubic volume of timber products harvested in Montana by county and product, 1988

County	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
----- Thousand cubic feet -----							
Beaverhead	2,854	—	—	66	247	—	3,167
Big Horn	2,235	—	—	—	33	—	2,268
Broadwater	450	—	—	81	—	—	532
Carbon	20	—	—	2	—	—	21
Carter	463	—	—	—	—	—	463
Cascade	864	—	—	—	8	—	872
Chouteau	1,290	—	—	—	—	—	1,290
Custer	74	—	—	—	—	—	74
Deerlodge	1,213	—	—	22	—	—	1,235
Fergus	2,027	—	—	104	—	—	2,131
Flathead	32,376	15,251	114	832	382	—	48,955
Gallatin	5,282	—	—	256	115	—	5,654
Granite	4,857	611	—	248	—	—	5,716
Hill	152	—	—	—	—	—	152
Jefferson	1,500	—	—	121	6	—	1,627
Judith Basin	9	—	—	56	—	—	65
Lake	7,449	2,560	884	21	6	—	10,920
Lewis and Clark	2,610	74	—	368	516	—	3,568
Lincoln	53,976	6,335	—	669	848	91	61,919
Madison	3,344	—	—	3	39	—	3,386
Meagher	2,800	—	—	8	—	—	2,808
Mineral	7,171	325	95	80	19	28	7,718
Missoula	17,238	8,487	853	214	26	14	26,831
Musselshell	725	—	—	—	—	—	725
Park	2,933	—	—	72	3	—	3,008
Powder River	2,770	—	—	—	—	—	2,770
Powell	7,120	3,537	—	71	—	—	10,727
Ravalli	6,307	132	—	42	292	—	6,773
Rosebud	2,301	—	—	—	—	—	2,301
Sanders	14,822	1,591	114	571	153	—	17,250
Silver Bow	479	—	—	59	—	—	538
Sweet Grass	1,394	—	—	26	—	—	1,420
Treasure	253	—	—	—	—	—	253
Wheatland	152	—	—	—	—	—	152
All counties¹	189,510	38,903	2,059	3,990	2,693	134	237,289

¹Data may not sum to totals due to rounding or truncating.

Table 8—Board-foot volume (Scribner rule) of timber products harvested in Montana by county and product, 1988

County	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
----- Thousand board feet -----							
Beaverhead	15,062	—	—	2	1,304	—	16,368
Big Horn	11,796	—	—	—	175	—	11,971
Broadwater	2,377	—	—	13	—	—	2,390
Carbon	104	—	—	8	—	—	112
Carter	2,441	—	—	—	—	—	2,441
Cascade	4,561	—	—	—	40	—	4,601
Chouteau	6,808	—	—	—	—	—	6,808
Custer	390	—	—	—	—	—	390
Deerlodge	6,400	—	—	10	—	—	6,410
Fergus	10,699	—	—	—	—	—	10,699
Flathead	170,851	80,481	600	300	2,018	—	254,250
Gallatin	27,876	—	—	301	609	—	28,786
Granite	25,630	3,225	—	151	—	—	29,006
Hill	800	—	—	—	—	—	800
Jefferson	7,917	—	—	229	30	—	8,176
Judith Basin	49	—	—	—	—	—	49
Lake	39,308	13,508	4,666	—	30	—	57,512
Lewis and Clark	13,771	393	—	93	2,725	—	16,982
Lincoln	284,835	33,428	—	—	4,477	480	323,220
Madison	17,646	—	—	—	207	—	17,853
Meagher	14,777	—	—	27	—	—	14,804
Mineral	37,842	1,717	500	9	98	150	40,316
Missoula	90,965	44,785	4,500	2	135	75	140,462
Musselshell	3,825	—	—	—	—	—	3,825
Park	15,477	—	—	46	18	—	15,541
Powder River	14,616	—	—	—	—	—	14,616
Powell	37,571	18,664	—	67	—	—	56,302
Ravalli	33,283	697	—	2	1,539	—	35,521
Rosebud	12,143	—	—	—	—	—	12,143
Sanders	78,215	8,395	600	—	805	—	88,015
Silver Bow	2,527	—	—	184	—	—	2,711
Sweet Grass	7,357	—	—	15	—	—	7,372
Treasure	1,333	—	—	—	—	—	1,333
Wheatland	800	—	—	—	—	—	800
All counties¹	1,000,052	205,293	10,866	1,459	14,210	705	1,232,585

¹Data may not sum to totals due to rounding or truncating.

Table 9—Board-foot (International ¼-inch rule) volume of timber products harvested in Montana by county and product, 1988

County	Product						All products¹
	Sawlogs	Veneer logs	Pulp	Posts and poles	House logs	Cedar products	
----- Thousand board feet -----							
Beaverhead	17,701	—	—	2	1,532	—	19,236
Big Horn	13,863	—	—	—	206	—	14,068
Broadwater	2,793	—	—	15	—	—	2,809
Carbon	122	—	—	9	—	—	132
Carter	2,869	—	—	—	—	—	2,869
Cascade	5,360	—	—	—	47	—	5,407
Chouteau	8,001	—	—	—	—	—	8,001
Custer	458	—	—	—	—	—	458
Deerlodge	7,521	—	—	12	—	—	7,533
Fergus	12,573	—	—	—	—	—	12,573
Flathead	200,784	94,581	705	353	2,372	—	298,795
Gallatin	32,760	—	—	354	716	—	33,829
Granite	30,120	3,790	—	177	—	—	34,088
Hill	940	—	—	—	—	—	940
Jefferson	9,304	—	—	269	35	—	9,608
Judith Basin	58	—	—	—	—	—	58
Lake	46,195	15,875	5,483	—	35	—	67,588
Lewis and Clark	16,184	462	—	109	3,202	—	19,957
Lincoln	334,738	39,285	—	—	5,261	564	379,848
Madison	20,738	—	—	—	243	—	20,981
Meagher	17,366	—	—	32	—	—	17,398
Mineral	44,472	2,018	588	11	115	176	47,379
Missoula	106,902	52,631	5,288	2	159	88	165,071
Musselshell	4,495	—	—	—	—	—	4,495
Park	18,189	—	—	54	21	—	18,264
Powder River	17,177	—	—	—	—	—	17,177
Powell	44,153	21,934	—	79	—	—	66,166
Ravalli	39,114	819	—	2	1,809	—	41,744
Rosebud	14,270	—	—	—	—	—	14,270
Sanders	91,918	9,866	705	—	946	—	103,435
Silver Bow	2,970	—	—	216	—	—	3,186
Sweet Grass	8,646	—	—	18	—	—	8,664
Treasure	1,567	—	—	—	—	—	1,567
Wheatland	940	—	—	—	—	—	940
All counties¹	1,175,261	241,260	12,770	1,715	16,700	829	1,448,534

¹Data may not sum to totals due to rounding or truncating.

Table 10—Cubic volume of timber products harvested in Montana by county and species, 1988

County	Species											
	True fir	Western larch	Engelmann spruce	Lodgepole pine	Whitebark and limber pine		Western white pine	Ponderosa pine	Douglas-fir	Western redcedar	Western hemlock	All species¹
----- Thousand cubic feet -----												
Beaverhead	62	—	138	1,894	21	—	—	100	951	—	—	3,167
Big Horn	—	—	2	35	—	—	—	2,217	15	—	—	2,268
Broadwater	1	—	16	167	—	—	—	8	339	—	—	532
Carbon	—	—	1	15	—	—	—	—	6	—	—	21
Carter	—	—	—	—	—	—	—	463	—	—	—	463
Cascade	—	—	8	73	—	—	—	516	276	—	—	872
Chouteau	65	—	58	227	—	—	—	618	323	—	—	1,290
Custer	—	—	—	—	—	—	—	74	—	—	—	74
Deerlodge	12	—	30	1,078	—	—	—	—	115	—	—	1,235
Fergus	—	—	87	65	—	—	—	1,695	285	—	—	2,131
Flathead	2,160	12,458	5,670	11,157	—	406	—	4,954	11,656	482	12	48,955
Gallatin	229	—	488	3,539	38	—	—	—	1,359	—	—	5,654
Granite	108	252	182	3,463	—	—	—	119	1,592	—	—	5,716
Hill	—	—	8	—	—	—	—	136	8	—	—	152
Jefferson	23	—	72	783	2	—	—	24	724	—	—	1,627
Judith Basin	—	—	—	21	—	—	—	4	40	—	—	65
Lake	608	2,216	1,155	1,255	—	34	—	2,903	2,638	110	—	10,920
Lewis and Clark	52	—	125	1,787	—	—	—	335	1,267	—	—	3,568
Lincoln	2,918	9,778	3,855	24,033	—	769	—	5,940	13,300	1,032	294	61,919
Madison	132	—	280	2,101	29	—	—	—	843	—	—	3,386
Meagher	—	—	81	1,456	—	—	—	16	1,256	—	—	2,808
Mineral	900	821	384	1,089	—	318	—	1,330	2,340	536	—	7,718
Missoula	1,207	3,717	2,473	3,738	—	151	—	4,156	11,188	201	—	26,831
Musselshell	—	—	—	38	—	—	—	687	—	—	—	725
Park	31	—	123	1,784	5	—	—	—	1,066	—	—	3,008
Powder River	—	—	—	—	—	—	—	2,770	—	—	—	2,770
Powell	248	1,111	630	3,929	—	—	—	713	4,096	—	—	10,727
Ravalli	262	321	438	803	—	—	—	2,046	2,903	—	—	6,773
Rosebud	—	—	—	—	—	—	—	2,301	—	—	—	2,301
Sanders	938	2,453	744	3,279	—	411	—	4,278	4,247	831	69	17,250
Silver Bow	16	—	35	364	3	—	—	4	115	—	—	538
Sweet Grass	3	—	29	595	1	—	—	34	758	—	—	1,420
Treasure	—	—	—	—	—	—	—	253	—	—	—	253
Wheatland	—	—	—	—	—	—	—	152	—	—	—	152
All counties¹	9,975	33,125	17,111	68,769	100	2,089	—	38,844	63,708	3,194	374	237,289

¹Data may not sum to totals due to rounding or truncating.

Table 11—Board-foot (Scribner rule) volume of timber products harvested in Montana by county and species, 1988

County	Species										All species¹
	True fir	Western larch	Engelmann spruce	Lodgepole pine	Whitebark and limber pine	Western white pine	Ponderosa pine	Douglas-fir	Western redcedar	Western hemlock	
----- Thousand board feet -----											
Beaverhead	325	—	730	9,650	112	—	530	5,021	—	—	16,368
Big Horn	—	—	8	183	—	—	11,699	81	—	—	11,971
Broadwater	7	—	82	466	1	—	43	1,791	—	—	2,390
Carbon	—	—	3	78	—	—	—	31	—	—	112
Carter	—	—	—	—	—	—	2,441	—	—	—	2,441
Cascade	—	—	42	383	—	—	2,721	1,455	—	—	4,601
Chouteau	343	—	306	1,198	—	—	3,259	1,702	—	—	6,808
Custer	—	—	—	—	—	—	390	—	—	—	390
Deerlodge	63	—	157	5,581	—	—	—	609	—	—	6,410
Fergus	—	—	460	45	—	—	8,689	1,505	—	—	10,699
Flathead	11,400	65,740	29,922	54,788	—	2,143	26,142	61,508	2,545	62	254,250
Gallatin	1,209	—	2,576	17,632	201	—	—	7,168	—	—	28,786
Granite	568	1,328	961	17,117	—	—	629	8,403	—	—	29,006
Hill	—	—	40	—	—	—	720	40	—	—	800
Jefferson	119	—	378	3,722	10	—	125	3,822	—	—	8,176
Judith Basin	—	—	1	12	—	—	20	16	—	—	49
Lake	3,206	11,692	6,096	6,512	—	180	15,320	13,923	583	—	57,512
Lewis and Clark	277	—	662	7,585	—	—	1,770	6,688	—	—	16,982
Lincoln	15,399	51,601	20,344	123,292	—	4,056	31,346	70,185	5,448	1,549	323,220
Madison	694	—	1,480	11,073	155	—	—	4,451	—	—	17,853
Meagher	—	—	425	7,669	—	—	82	6,628	—	—	14,804
Mineral	4,750	4,331	2,028	5,337	—	1,677	7,017	12,346	2,830	—	40,316
Missoula	6,368	19,613	13,051	18,598	—	799	21,932	59,038	1,063	—	140,462
Musselshell	—	—	—	200	—	—	3,625	—	—	—	3,825
Park	162	—	648	9,081	27	—	—	5,623	—	—	15,541
Powder River	—	—	—	—	—	—	14,616	—	—	—	14,616
Powell	1,310	5,862	3,323	20,428	—	—	3,762	21,617	—	—	56,302
Ravalli	1,384	1,693	2,310	4,018	—	—	10,799	15,317	—	—	35,521
Rosebud	—	—	—	—	—	—	12,143	—	—	—	12,143
Sanders	4,951	12,942	3,925	14,291	—	2,169	22,574	22,413	4,385	365	88,015
Silver Bow	86	—	184	1,794	18	—	22	607	—	—	2,711
Sweet Grass	16	—	153	3,020	3	—	180	4,000	—	—	7,372
Treasure	—	—	—	—	—	—	1,333	—	—	—	1,333
Wheatland	—	—	—	—	—	—	800	—	—	—	800
All counties¹	52,637	174,802	90,295	343,753	527	11,024	204,729	335,988	16,854	1,976	1,232,585

¹Data may not sum to totals due to rounding or truncating.

Table 12—Board-foot (International 1/4-inch rule) volume of timber products harvested in Montana by county and species, 1988

County	True fir	Western larch	Species							Douglas-fir	Western redcedar	Western hemlock	All species ¹
			Engelmann spruce	Lodgepole pine	Whitebark		Ponderosa pine						
					and limber pine	Western white pine							
----- Thousand board feet -----													
Beaverhead	382	—	858	11,341	132	—	—	623	5,901	—	—	19,236	
Big Horn	—	—	9	215	—	—	—	13,749	95	—	—	14,068	
Broadwater	8	—	96	548	1	—	—	50	2,105	—	—	2,809	
Carbon	—	—	4	92	—	—	—	—	36	—	—	132	
Carter	—	—	—	—	—	—	—	2,869	—	—	—	2,869	
Cascade	—	—	49	450	—	—	—	3,198	1,710	—	—	5,407	
Chouteau	403	—	360	1,408	—	—	—	3,830	2,000	—	—	8,001	
Custer	—	—	—	—	—	—	—	458	—	—	—	458	
Deerlodge	74	—	184	6,559	—	—	—	—	716	—	—	7,533	
Fergus	—	—	541	53	—	—	—	10,211	1,769	—	—	12,573	
Flathead	13,397	77,258	35,164	64,387	—	—	2,518	30,722	72,284	2,991	73	298,795	
Gallatin	1,421	—	3,027	20,721	236	—	—	—	8,424	—	—	33,829	
Granite	668	1,561	1,129	20,116	—	—	—	739	9,875	—	—	34,088	
Hill	—	—	47	—	—	—	—	846	47	—	—	940	
Jefferson	140	—	444	4,374	12	—	—	147	4,492	—	—	9,608	
Judith Basin	—	—	1	14	—	—	—	24	19	—	—	58	
Lake	3,768	13,740	7,164	7,653	—	—	212	18,004	16,362	685	—	67,588	
Lewis and Clark	326	—	778	8,914	—	—	—	2,080	7,860	—	—	19,957	
Lincoln	18,097	60,642	23,908	144,893	—	—	4,767	36,838	82,481	6,402	1,820	379,848	
Madison	816	—	1,739	13,013	182	—	—	—	5,231	—	—	20,981	
Meagher	—	—	499	9,013	—	—	—	96	7,789	—	—	17,398	
Mineral	5,582	5,090	2,383	6,272	—	—	1,971	8,246	14,509	3,326	—	47,379	
Missoula	7,484	23,049	15,338	21,856	—	—	939	25,774	69,381	1,249	—	165,071	
Musselshell	—	—	—	235	—	—	—	4,260	—	—	—	4,495	
Park	190	—	762	10,672	32	—	—	—	6,608	—	—	18,264	
Powder River	—	—	—	—	—	—	—	17,177	—	—	—	17,177	
Powell	1,540	6,889	3,905	24,007	—	—	—	4,421	25,404	—	—	66,166	
Ravalli	1,626	1,990	2,715	4,722	—	—	—	12,691	18,000	—	—	41,744	
Rosebud	—	—	—	—	—	—	—	14,270	—	—	—	14,270	
Sanders	5,818	15,209	4,613	16,795	—	—	2,549	26,529	26,340	5,153	429	103,435	
Silver Bow	101	—	216	2,108	21	—	—	26	713	—	—	3,186	
Sweet Grass	19	—	180	3,549	4	—	—	212	4,701	—	—	8,664	
Treasure	—	—	—	—	—	—	—	1,566	—	—	—	1,566	
Wheatland	—	—	—	—	—	—	—	940	—	—	—	940	
All counties ¹	61,859	205,427	106,115	403,978	619	—	12,955	240,598	394,853	19,807	2,322	1,448,534	

¹Data may not sum to totals due to rounding or truncating.

Table 13—Cubic volume of timber products harvested in Montana by county and owner, 1988

County	Owner						All owners ¹
	National Forest	Bureau of Land Management	State	Tribal	Forest industry	Other private	
----- <i>Thousand cubic feet</i> -----							
Beaverhead	2,092	140	323	—	—	612	3,167
Big Horn	52	—	—	1,648	—	569	2,268
Broadwater	250	—	—	—	—	281	532
Carbon	—	—	—	—	—	21	21
Carter	190	—	—	—	—	273	463
Cascade	1	—	2	—	—	870	872
Chouteau	—	—	—	—	—	1,290	1,290
Custer	—	—	—	—	—	74	74
Deerlodge	13	—	190	—	4	1,028	1,235
Fergus	336	57	20	—	—	1,719	2,131
Flathead	18,026	—	1,695	1,018	25,196	3,020	48,955
Gallatin	957	—	25	—	3,665	1,008	5,654
Granite	2,380	149	35	—	1,746	1,407	5,716
Hill	—	—	—	152	—	—	152
Jefferson	563	—	57	—	—	1,008	1,627
Judith Basin	62	—	—	—	—	4	65
Lake	826	—	1,501	5,007	2,099	1,487	10,920
Lewis and Clark	1,693	—	150	—	164	1,560	3,568
Lincoln	38,838	—	1,328	—	13,211	8,542	61,919
Madison	863	424	12	—	1,937	150	3,386
Meagher	950	—	265	—	—	1,594	2,808
Mineral	5,313	—	128	—	423	1,854	7,718
Missoula	2,812	459	1,292	474	16,609	5,186	26,831
Musselshell	—	57	—	—	—	668	725
Park	482	—	—	—	544	1,982	3,008
Powder River	1,159	—	63	—	—	1,548	2,770
Powell	4,355	293	13	—	4,208	1,858	10,727
Ravalli	5,051	—	55	—	152	1,516	6,773
Rosebud	—	—	25	1,856	—	420	2,301
Sanders	6,854	—	702	1,006	5,577	3,111	17,250
Silver Bow	50	—	—	—	—	488	538
Sweet Grass	1,352	—	—	—	—	68	1,420
Treasure	—	—	21	—	—	232	253
Wheatland	—	—	—	—	—	152	152
All counties ¹	95,516	1,579	7,900	11,161	75,534	45,599	237,289

¹Data may not sum to totals due to rounding or truncating.

Table 14—Board-foot (Scribner rule) volume of timber products harvested in Montana by county and owner, 1988

County	Owner						All owners ¹
	National Forest	Bureau of Land Management	State	Tribal	Forest industry	Other private	
----- Thousand board feet -----							
Beaverhead	10,705	738	1,698	—	—	3,227	16,368
Big Horn	272	—	—	8,695	—	3,004	11,971
Broadwater	1,195	—	—	—	—	1,195	2,390
Carbon	—	—	—	—	—	112	112
Carter	1,000	—	—	—	—	1,441	2,441
Cascade	4	—	8	—	—	4,589	4,601
Chouteau	—	—	—	—	—	6,808	6,808
Custer	—	—	—	—	—	390	390
Deerlodge	6	—	1,000	—	—	5,404	6,410
Fergus	1,266	300	104	—	—	9,029	10,699
Flathead	94,635	—	8,674	5,374	132,897	12,670	254,250
Gallatin	5,048	—	—	—	18,937	4,801	28,786
Granite	11,608	784	89	—	9,197	7,328	29,006
Hill	—	—	—	800	—	—	800
Jefferson	2,649	—	300	—	—	5,227	8,176
Judith Basin	30	—	—	—	—	19	49
Lake	4,351	—	7,912	26,424	11,075	7,750	57,512
Lewis and Clark	7,881	—	792	—	535	7,774	16,982
Lincoln	202,045	—	7,000	—	69,715	44,460	323,220
Madison	4,539	2,238	63	—	10,220	793	17,853
Meagher	4,995	—	1,400	—	—	8,409	14,804
Mineral	27,721	—	600	—	2,234	9,761	40,316
Missoula	14,259	2,424	6,805	2,500	87,621	26,853	140,462
Musselshell	—	300	—	—	—	3,525	3,825
Park	2,542	—	—	—	2,870	10,129	15,541
Powder River	6,117	—	333	—	—	8,166	14,616
Powell	22,780	1,547	69	—	22,162	9,744	56,302
Ravalli	26,443	—	283	—	800	7,995	35,521
Rosebud	—	—	130	9,794	—	2,219	12,143
Sanders	35,873	—	3,683	2,664	29,416	16,379	88,015
Silver Bow	140	—	—	—	—	2,571	2,711
Sweet Grass	7,012	—	—	—	—	360	7,372
Treasure	—	—	111	—	—	1,222	1,333
Wheatland	—	—	—	—	—	800	800
All counties ¹	495,116	8,331	41,054	56,251	397,679	234,154	1,232,585

¹Data may not sum to totals due to rounding or truncating.

Table 15—Board-foot (International 1/4-inch rule) volume of timber products harvested in Montana by county and owner, 1988

County	Owner						All owners¹
	National Forest	Bureau of Land Management	State	Tribal	Forest industry	Other private	
-----Thousand board feet-----							
Beaverhead	12,580	867	1,995	—	—	3,792	19,236
Big Horn	320	—	—	10,218	—	3,530	14,068
Broadwater	1,404	—	—	—	—	1,404	2,809
Carbon	—	—	—	—	—	132	132
Carter	1,175	—	—	—	—	1,693	2,869
Cascade	5	—	9	—	—	5,393	5,407
Chouteau	—	—	—	—	—	8,001	8,001
Custer	—	—	—	—	—	458	458
Deerlodge	7	—	1,175	—	—	6,351	7,533
Fergus	1,488	352	122	—	—	10,611	12,573
Flathead	111,215	—	10,194	6,316	156,180	14,890	298,795
Gallatin	5,932	—	—	—	22,255	5,642	33,829
Granite	13,642	921	105	—	10,808	8,612	34,088
Hill	—	—	—	940	—	—	940
Jefferson	3,113	—	353	—	—	6,143	9,608
Judith Basin	35	—	—	—	—	22	58
Lake	5,113	—	9,298	31,053	13,015	9,108	67,588
Lewis and Clark	9,262	—	931	—	629	9,136	19,957
Lincoln	237,443	—	8,226	—	81,929	52,249	379,848
Madison	5,334	2,630	74	—	12,010	932	20,981
Meagher	5,870	—	1,645	—	—	9,882	17,398
Mineral	32,578	—	705	—	2,625	11,471	47,379
Missoula	16,757	2,849	7,997	2,938	102,972	31,558	165,071
Musselshell	—	353	—	—	—	4,142	4,495
Park	2,987	—	—	—	3,373	11,904	18,264
Powder River	7,189	—	391	—	—	9,597	17,177
Powell	26,771	1,818	81	—	26,045	11,451	66,166
Ravalli	31,076	—	333	—	940	9,396	41,744
Rosebud	—	—	153	11,510	—	2,608	14,270
Sanders	42,158	—	4,328	3,131	34,570	19,249	103,435
Silver Bow	164	—	—	—	—	3,021	3,186
Sweet Grass	8,240	—	—	—	—	423	8,664
Treasure	—	—	130	—	—	1,436	1,566
Wheatland	—	—	—	—	—	940	940
All counties¹	581,860	9,791	48,247	66,106	467,352	275,178	1,448,534

¹Data may not sum to totals due to rounding or truncating.

Table 16—Cubic volume of timber products harvested in Montana by species and owner, 1988

Species	Owner						All owners ¹
	National Forest	Bureau of Land Management	State	Tribal	Forest industry	Other private	
----- Thousand cubic feet -----							
True fir	4,314	10	384	442	3,105	1,719	9,975
Western larch	11,310	170	1,285	828	16,832	2,699	33,125
Engelmann spruce	7,912	34	506	499	5,182	2,979	17,111
Lodgepole pine	37,433	497	1,663	1,313	11,984	15,879	68,769
Whitebark and limber pine	23	5	2	—	55	14	100
Western white pine	1,038	—	70	3	574	404	2,089
Ponderosa pine	11,006	204	1,618	6,318	9,357	10,341	38,844
Douglas-fir	20,509	657	2,305	1,682	27,529	11,026	63,708
Western redcedar	1,888	—	54	75	816	362	3,194
Western hemlock	84	—	13	—	102	176	374
All species ¹	95,516	1,579	7,900	11,161	75,534	45,599	237,289

¹Data may not sum to totals due to rounding or truncating.**Table 17**—Board-foot (Scribner rule) volume of timber products harvested in Montana by species and owner, 1988

Species	Owner						All owners¹
	National Forest	Bureau of Land Management	State	Tribal	Forest industry	Other private	
----- Thousand board feet -----							
True fir	22,768	55	2,026	2,331	16,386	9,071	52,637
Western larch	59,681	899	6,782	4,372	88,823	14,245	174,802
Engelmann spruce	41,751	177	2,668	2,633	27,346	15,720	90,295
Lodgepole pine	189,057	2,625	8,143	4,283	62,327	77,318	343,753
Whitebark and limber pine	122	28	12	—	291	74	527
Western white pine	5,475	—	370	18	3,028	2,133	11,024
Ponderosa pine	57,828	1,079	8,538	33,341	49,371	54,572	204,729
Douglas-fir	108,030	3,468	12,163	8,877	145,267	58,183	335,988
Western redcedar	9,962	—	283	396	4,304	1,909	16,854
Western hemlock	442	—	69	—	536	929	1,976
All species¹	495,116	8,331	41,054	56,251	397,679	234,154	1,232,585

¹Data may not sum to totals due to rounding or truncating.

Table 18—Board-foot (International ¼-inch rule) volume of timber products harvested in Montana by species and owner, 1988

Species	Owner						All owners ¹
	National Forest	Bureau of Land Management	State	Tribal	Forest industry	Other private	
----- Thousand board feet -----							
True fir	26,757	65	2,381	2,739	19,257	10,660	61,859
Western larch	70,137	1,056	7,970	5,138	104,385	16,741	205,427
Engelmann spruce	49,066	208	3,135	3,094	32,137	18,474	106,115
Lodgepole pine	222,180	3,085	9,570	5,034	73,247	90,864	403,978
Whitebark and limber pine	143	33	14	—	342	87	619
Western white pine	6,434	—	435	21	3,558	2,507	12,955
Ponderosa pine	67,959	1,268	10,034	39,182	58,021	64,133	240,598
Douglas-fir	126,957	4,076	14,294	10,432	170,718	68,377	394,853
Western redcedar	11,707	—	333	465	5,058	2,243	19,807
Western hemlock	519	—	81	—	630	1,092	2,322
All species ¹	581,860	9,791	48,247	66,106	467,352	275,178	1,448,534

¹Data may not sum to totals due to rounding or truncating.

Table 19—Estimated volume, in bone dry units, of used and unused residue from mills in Montana, 1988 (Keegan and others n.d.)

Residue	Product			Total used	Unused	Total produced
	Pulp and boards	Plant fuel	Other			
----- Thousand bone dry units -----						
Bark	—	348	27	375	61	436
Coarse ¹	827	46	—	873	28	901
Fines ²	327	173	1	501	75	576
Total	1,154	567	28	1,749	164	1,913

¹Material suitable for chipping, such as slabs, edgings, and trim.

²Sawdust and planer shavings.

Table 20—Estimated volume, in thousand cubic feet¹, of used and unused residue from mill operations in Montana, 1988



Residue	Product			Total used	Unused	Total produced
	Pulp and boards	Plant fuel	Other			
----- <i>Thousand cubic feet</i> -----						
Bark	—	33,408	2,592	36,000	5,856	41,856
Coarse ²	79,392	4,416	—	83,808	2,688	86,496
Fines ³	31,392	16,608	96	48,096	7,200	55,296
Total	110,784	54,432	2,688	167,904	15,744	183,648

¹Residue data were reported in bone dry units (Keegan and others n.d.). A BDU/cubic feet conversion factor was unavailable; however, Cunit conversions were available for both pounds and cubic feet. BDU's were converted to cubic feet as follows:

1 bone dry unit = 2,400 pounds (ovendry weight)

1 Cunit = 2,500 pounds (ovendry weight) = 100 cubic feet

Therefore:

$$1 \text{ bone dry unit} = \frac{2,400}{2,500} \times 100 = 96 \text{ cubic feet.}$$

²Material suitable for chipping, such as slabs, edgings, and trim.

³Sawdust and planer shavings.

APPENDIX: CONVERSION FACTORS

Table 21—Conversion factors used in preparing volume figures for this report

Product	Cords	Piece	Cubic feet	Board feet	
				Scribner rule	International 1/4-inch rule
Sawlogs and other roundwood ¹	—	—	1.000	5.277	6.201
Sawlogs and other roundwood ¹	—	—	—	1.000	1.175
Pulpwood ²	1	—	63.167	333.333	391.666
Pulpwood ²	—	—	1.000	5.277	6.201
Utility poles ³	—	1	—	93.000	—
Posts ³	—	1	1.017	—	—

Mill residues

Mill residue reported in Bone Dry Units (BDU's) and converted to cubic feet as follows:

1 bone dry unit = 2,400 pounds (ovendry weight)

1 Cunit = 2,500 pounds (ovendry weight) = 100 cubic feet

Therefore:

$$1 \text{ bone dry unit} = \frac{2,400}{2,500} \times 100 = 96 \text{ cubic feet.}$$

¹Veneer logs, house logs, and cedar products. From logging utilization data collected on active logging operations in Montana in 1988.

²Round pulpwood was reported in mixed units. These units were converted to cords. Cords were converted to thousand board feet (Scribner rule) using 3 cords/thousand board feet. Conversions from thousand board feet (Scribner rule) to thousand board feet (International 1/4-inch rule) and thousand cubic feet used the same factors as were used for sawlogs.

³Utility poles, posts, and rails. Cubic and board-foot (Scribner rule) volumes computed from actual dimensions. Board-foot (International 1/4-inch rule) volumes derived from 1 board foot (Scribner rule) equals 1.175 board feet (International 1/4-inch rule). Posts and poles with small-end diameters less than 6 inches have 0 board feet.

McLain, William H.; Keegan, Charles E., III; Wichman, Daniel P. 1992. Montana's timber production and mill residue, 1988. Resour. Bull. INT-77. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 17 p.

Reports 1988 timber production estimates for Montana by county, species, owner, and product. Also reports estimates of mill residue by use. Data were obtained by canvassing Montana's primary wood processors and out-of-State mills receiving logs harvested in Montana.

KEYWORDS: timber products output, sawlog production, roundwood, forest products, logging, growing-stock, sawmilling, primary conversion



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